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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR  | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|-----------------------|---------------------|------------------|
| 10/714,214  | 11/14/2003  | Joseph John Sumakeris | 5308-223CT          | 2561             |
| 20792   | 7590        | 11/23/2005            | EXAMINER            |                  |
| MYERS BIGEL SIBLEY & SAJOVEC<br>PO BOX 37428<br>RALEIGH, NC 27627 |             |                       | FIORITO, JAMES      |                  |
|   |             |                       | ART UNIT            | PAPER NUMBER     |
|   |             |                       | 1763                |                  |
| DATE MAILED: 11/23/2005   |             |                       |                     |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/714,214

Applicant(s)

SUMAKERIS ET AL.

Examiner

James A. Fiorito

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 14 November 2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Specification*

Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. **If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement.** In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

It appears the most important aspects of the invention relate to the liner, which are not described sufficiently in the abstract.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: Hot-wall chemical vapor deposition induction heating reactor with a liner.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claims 1-7 make reference to susceptors, the definition of a susceptor used for examining chemical vapor deposition assemblies is, a member that directly supports the

substrate. The susceptors identified in the specification of the present application do not directly support the substrate. Therefore, the use of the word susceptor in the present application is unclear. The word susceptor henceforth will be considered a wall member as described in the specification.

***Claim Rejections - 35 USC § 102***

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Kordina (EP 0956376).**

*With respect to Claim 1:* Kordina discloses a housing assembly for an induction heating device (Fig. 5 Item 18), the housing assembly defining a processing chamber and comprising: a susceptor surrounding at least a portion of the processing chamber (Fig. 5 Item 13 and 14); and a thermally conductive liner interposed between the susceptor and the processing chamber wherein the liner is separately formed from the susceptor, wherein the liner is removable from the susceptor without requiring disassembly of the susceptor (Fig. 5 Item 16 and 17).

*With respect to Claim 2:* Kordina discloses a housing assembly of Claim 1 including: a first susceptor portion and a second susceptor portion disposed on opposed sides of the processing chamber (Fig. 5 Items 13 and 14); a first liner disposed between the first susceptor portion and the processing chamber (Fig. 5 Item 16); and a second

liner disposed between the second susceptor portion and the processing chamber (Fig. 5 Item 17).

**Claims 5-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Hölzlein (US 6,406,983).**

*With respect to Claim 5:* Hölzlein discloses a housing assembly for an induction heating device, the housing assembly defining a processing chamber and comprising: a susceptor surrounding at least a portion of the processing chamber (Fig. 1 Item 13; Fig. 2 Item 13, Entire Cylindrical Portion); and a thermally conductive liner interposed between the susceptor and the processing chamber (Fig. 1 Item 17; Fig. 2 Item 17), wherein the liner is separately formed from the susceptor; wherein the susceptor includes a susceptor core of a first material (Fig. 1 Item 21; Fig. 2 Item 21) and a susceptor coating of a second material (Fig. 1 Item 20; Fig. 2 Item 20); and wherein the second material is selected from the group consisting of refractory metal carbides (Column 7 Lines 39-41).

*With respect to Claim 6:* Hölzlein discloses a housing assembly of Claim 5 wherein the second material is TaC (Column 7 Lines 39-41).

*With respect to Claim 7:* Hölzlein discloses a housing assembly of Claim 5 wherein the first material is graphite (Column 7 Lines 35-37).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kordina (EP 0956376) in view of Mezey (US 6,331,212).**

*With respect to Claim 3:* Kordina discloses a housing assembly for an induction heating device, the housing assembly defining a processing chamber and comprising: a susceptor surrounding at least a portion of the processing chamber (Fig. 2); and a thermally conductive liner interposed between the susceptor and the processing chamber (Fig. 5 Item 16 and 17), wherein the liner is separately formed from the susceptor; wherein the susceptor includes a platter region (Fig. 2 Item 5), the housing assembly further including: a platter adapted to support the article disposed in the processing chamber and overlying the platter region (Fig. 2 Item 2).

Kordina does not expressly state an opening defined in the liner and interposed between the platter region and the platter.

Mezey discloses an opening (Fig. 4 Item 134) defined in the susceptor interposed between the platter region (Fig. 4 Item 134) and the platter (Fig. 4 Item 122). Kordina and Mezey are analogous art because they are from the same field of endeavor, namely hot-walled inductive heating chemical vapor deposition assemblies.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to form Kordina's assembly including an opening defined in the susceptor

interposed between the platter region and the platter in view of the teaching of Mezey. The suggestion or motivation for doing so would have been to provide an assembly wherein the platter is arranged to fit into a recessed area so that the top of the wafer can be held substantially planar with the areas of the bottom surface of the process zone that surround recessed area (Column 11 Lines 36-40). Therefore, It would have been obvious to combine Kordina with Mezey for the benefit of an assembly with an opening defined in the liner and interposed between the platter region and the platter to obtain the invention specified in Claim 3.

**Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mezey (US 6,331,212) in view of Kuramata (JP 01027225).**

*With respect to Claim 4:* Mezey discloses a housing assembly for an induction heating device, the housing assembly defining a processing chamber (Fig. 4 Item 166) and comprising: a susceptor surrounding at least a portion of the processing chamber (Fig. 4 Item 134); and a thermally conductive liner interposed between the susceptor and the processing chamber, wherein the liner is separately formed from the susceptor (Fig. 4 Item 150).

Mezey does not expressly state the liner varies in thickness along at least a portion of its length.

Kuramata discloses a housing assembly for an induction heating device with a liner, which varies in thickness along at least a portion of its length (Fig. 5 Item 12, Page 2 Lower Right Column Lines 1-7). Mezey and Kuramata are analogous art because they

are from the same field of endeavor, namely induction heating chemical deposition assemblies.

At the time of invention it would have been obvious to a person of ordinary skill in the art to form Mezey's housing assembly including a liner that varies in thickness along at least a portion of its length in view of the teaching of Kuramata. The suggestion or motivation for doing so would have been to increase the velocity of the gas, since the stagnant gas layer to be penetrated for deposition on the substrate will be thinner and the growth rate will increase. Therefore, it would have been obvious to combine Mezey with Kuramata for the benefit of a liner that varies in thickness along at least a portion of its length to obtain the invention specified in Claim 4.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Glass (US 5,667,587) teaches a liner with a varying thickness. Reuschel (US 3,868,924) teaches an induction heating deposition reactor made of graphite and Silicon Carbide. Aschner (US 6,005,226) teaches a rapid thermal processing system with gas driven rotating substrate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Fiorito whose telephone number is (571)272-7426. The examiner can normally be reached on Standard.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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